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11	Reclus and Chevassu, 1903.	.....	F.	49	5 years.	Pulsation, no expansion, soufflé; upon pressure tumor apparently is a large vessel; soft, nerves.	Encapsulated, brown, smooth, lobulated, elastic, adherent to the large vessels and	Common, internal, external carotids.	Cervical branch of facial.	None.	Masses of cells surrounded by capillaries whose walls are thin; the cell nuclei project into their lumina.	Not noted.	Cured.	Revue de Chir., xxvii, No. 8, 1903.
12	Scudder, 1903.	.....	F.	Between 20 and 30	9 years.	Size of pigeon's egg; movable sidewise and over skin, pulsation, no expansion.	Tumor attached to the carotid artery.	Common, internal carotids.	.....	None.	Many vessels between which are large round and spindle cells and origin'tein tissue between vessels.	Not noted.	Variety of angiosarcoma Known as perithelioma of the carotid gland.	Cured; in months, no recurrence.	13 Scudder, Amer. Jour. of Med. Sc., Sept., 19.3,
13	Macphater,* 1903.	.....	F.	34	6 years.	First noticed after confinem't; growth slow until recently, then pain and uneasiness, pulsat'n, no expansion, left side.	Firm, nodular invaded the surrounding structure; vascular.	Common, external and internal carotids; internal jugular vein.	None.	None.	No description.	Not noted.	Undetermined.	Cured.	N. Y. and Phila. Med. Jour., 1903, Vol. lxxvii, No. 4.
14	MM. Cuneo and Francois Dainville, 1903.	.....	.....	23	3 years.	Rt. side lancinating paln radiating into right carotid, comes, nosis, sympathetic disturbance of face, swallowing difficult.	Not adherent to posterior carotid; compression, pneumogastric slightly.	None.	None.	None.	Fibroma presenting large vascular and lymphatic cavities.	Not noted.	Tumor of retro-carotid corpuscle.	Cured.	Société anatomique, 10, Juillet, 1903.
15	Hearn, 1903.	T. J. R.	M.	48	6 years	Rt. side below angle of jaw; growth slow, no inconvenience, no pulsation, not attached to skin.	Encapsulated, firm, adherent to surrounding structure, carotids on its anterior surface.	Common, external and internal carotids; internal jugular vein.	None.	None.	See below.	Question of fibroma, lymphoma or aberrant thyroid.	Perithelioma of the carotid body.	Cured of the operation, but died 2 months later.	.....

*This case was not reported as a tumor of the carotid body, but the clinical history, general character, and operative difficulties seem to me to establish clearly the nature of the growth.

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THE CONCUSSIONAL VERTEBRAL REFLEXES.

BY

ALBERT ABRAMS, A.M., M.D.,

of San Francisco.

In medical literature I have repeatedly referred to certain visceral reflexes evoked by cutaneous irritation, viz., the lung reflexes of dilation[1] and contraction,[2] the heart reflex,[3] liver reflex,[4] the intestinal and stomach reflexes,[5] and more recently, to the aortic reflexes.[6] The reflexes in question are endowed with more than mere physiologic interest. They yield unequivocal demonstration of the fact that the sensory peripheral nerve terminations receive impressions which are conducted, communicated, or reflected by aid of the nervous system. Such impressions react on the viscera, and the manifestations of the reaction may be utilized in a diagnostic and therapeutic direction. The evidence heretofore adduced in explanation of the results achieved by electric, hydriatic, mechanical, and the balneary treatment of disease was naught else than a mere array of words conceived in conjecture only. Others less inclined to hypothesize sought an expeditious solution of the subject by referring their action to psychic suggestion. The recognition of the visceral reflexes is something more than an apologetic attempt to relegate the therapeutic procedures just mentioned to their proper sphere of action. The noteworthy investigations of Head, show, that in visceral disease, pain and disturbed sensation may be referred to definite cutaneous areas. Clinicians have given due regard to such cutaneous expression of visceral disease, which, if I may be permitted to call it, is practically an endogenetic skin reflex. They have, however, ignored the fact that we likewise possess exogenetic skin reflexes. It is within the realms of reason to anticipate that by means of the latter reflexes, we will be able to determine the condition of a viscus with as much precision as is now attained in the electrodiagnosis of a nerve and muscle. I have already shown that the heart and lung reflexes may be elicited elsewhere than through the skin. Thus the lung reflex of dilation, while localized by cutaneous irritation, may be made to implicate both lungs by irritation of the nasal mucosa or by percussion of the epigastrium. Similarly the lung reflex of contraction may be evoked by the application to the nasal mucosa of certain medicaments, and the latter fact is of great practical value, considering it as a method of procedure in the treatment of asthma, a subject which will receive further consideration in a forthcoming work on the latter disease. The heart reflex, as already shown, may be provoked by irritation of the nasal, gastric, and rectal mucosa. More recent investigations by me demonstrate that the heart reflex can be elicited by swallowing. If the patient, standing before the röntgen rays is instructed to swallow water, each act of deglutition is followed by a visible contraction of the heart, *i. e.*, a recession of the myocardium

dissociated with the normal contraction of that muscle. The latter fact, no doubt explains the resuscitating effects of swallowing water in faintness acting similarly to the impact of water on the skin by inducing the heart reflex. Physicians have always recognized the effects of emotions on the heart, but no tangible evidence of such effects has been forthcoming. The epigram of Peter is worth repetition; "The physical heart is the counterpart of a moral heart." The conventional expression of the frightened individual, "My heart was in my mouth," finds justification by a röntgen ray study of the heart. Tell the patient standing before the rays that you are going to burn him with a hot iron, and the effect on the heart is at once manifest. It is a veritable psychic heart reflex implicating the entire heart. The latter becomes at once very much reduced in size, and appears as if it were retreating toward the neck. I know of no irritation, cutaneous or otherwise, that is so pronounced as is this psychic factor of fright in inducing the heart reflex.

The foregoing fact is of the utmost importance in eliminating emotional influences in the treatment of cardiac diseases. Even in an ordinary röntgen ray examination of the heart, one may observe in nervous patients a retraction of the heart mass. Mr. Bezley Thorne[7] noted that the heart shrank after exposure to the röntgen rays. It is evident that the shrinkage thus observed was naught else but cardiac reaction to emotional influences, for a röntgen ray examination to the average patient is a momentous procedure. I have frequently witnessed the pulmonary reaction of fright; the lungs become hyperresonant on percussion and the superficial areas of cardiac, hepatic and splenic dulness become diminished (psychic lung reflex of dilation). I have more recently elicited a heart reflex limited to the right heart ventricle. If we percuss the muscles (tapotement) of the extremities we can at once obliterate the area of superficial cardiac dulness. This is essentially a heart reflex of muscular origin exclusively, as such a reaction does not follow irritation of the skin of the extremities nor after percussion of the bones. Percussion of the muscles of one arm only suffices to elicit this heart reflex. Another curious feature of the myopathic heart reflex is that it causes retraction of the right heart ventricle only, the left being uninfluenced. Placing the subject before the röntgen rays, this reflex is at once evident. After the heart borders are outlined, request an assistant to percuss the muscles of one arm by means of a percussion hammer. Following the maneuver, the right ventricle shows considerable retraction. The effect on the systemic blood-pressure by percussion of the muscles is very slight and this is obvious considering that the left heart ventricle is uninfluenced by the maneuver. Like many other innovations in medicine my reflexes have by no means been unconditionally accepted by the profession and even doubt has been cast on their existence and I may therefore be pardoned if I cite the corroboration of other observers. In this country, Cabot, Monell and Cooper have recognized the practical value of my reflexes. At a meeting of the Société Médicale des Hôpitaux (July 24, 1903), MM. Pierre Merklen and Jean Heitz, read a paper on the "Reflexe Cardiaque d'Abrams,"[8] and confirmed and extended my observations. In England, Auld[9] refers to the practical value of the "lung reflex of Abrams," in diagnosis and treatment. His observations show that much light was shed on the state of the lungs by testing their response, either in whole or in part to the normal reflexes, and Auld suggests that the latter should be tested as a matter of routine in the investigation of cardiopulmonary diseases, just as the reflexes are tested in the investigation of diseases of the nervous system. In Italy, Dr. Augusto Plessi[10] recognizes the importance of the lung reflexes in diagnosis, as they enable us to differentiate lung dulness dependent on consolidation from that dependent on atelectasis. In studying the vertebral reflexes we enter an entirely new domain and one may be very readily convinced that the manipulation of the vertebras by the osteopath and the effects on the patient, are not wholly a question of suggestion; on the contrary, the osteopath unknowingly elicits many visceral reflexes, which may operate for good or evil. Concussion of the vertebral spinous processes whether by manual manipulation or by vibratory massage, will induce palpable, lung, heart, liver, spleen, stomach and intestinal reflexes depending on the vertebras subjected to concussion. In eliciting the concussional vertebral reflexes, I employ an S. S. White dental mallet weighing about 4 oz. and a pleximeter of felt (Fig. 1).

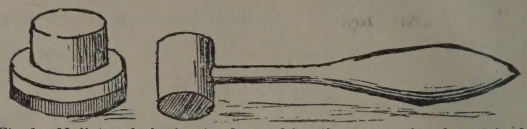

Fig. 1.—Mallet and pleximeter for evoking the concussional vertebral reflexes, as well as the lung reflex of contraction and the stomach and intestinal reflexes.

In the absence of the latter, one may strike the spinous processes of the vertebras with the knuckle of the second finger, although with less effective results. In either method, the spinous processes to be concussed having been marked with a dermograph, they are struck a series of sharp, vigorous blows. The reaction on the viscus or viscera is of short duration, hence the objective demonstration of the visceral reflex as ascertained by percussion must be executed immediately after vertebral concussion. It may be superfluous to add that previous to the execution of the vertebral concussional maneuver, the heart, spleen, and liver must be defined by topographic percussion, so that the subsequent change in the area of percussion of the organ may be recognized.

The anatomic landmarks of the spine are easy of

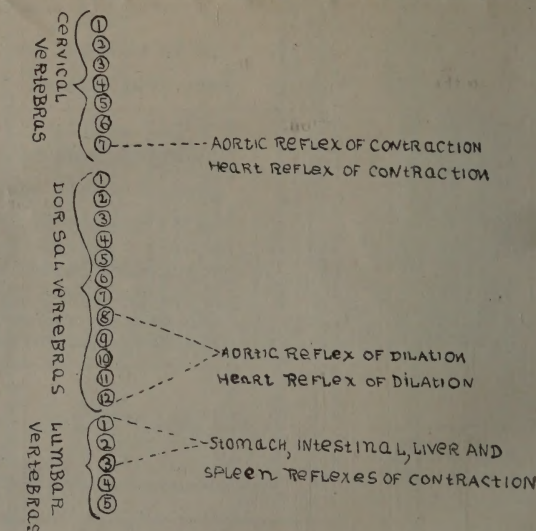

Fig. 2.—Vertebral concussional reflexes, showing the vertebras to be concussed for their elicitation.

recognition. First, there is usually a furrow or median groove in the back, at the bottom of which lie the spinous processes. In emaciated individuals the spinous line replaces the groove. Palpation and definition of the spines is facilitated by directing the patient to double over to the front, or the spines may be rubbed with the hand, thus evoking a spot of hyperemic redness over the tip of each spinous process. For our purpose, it is only

necessary to define the processes from the seventh cervical to the third lumbar vertebra. The seventh cervical vertebra is readily recognized owing to its prominence, and may serve as a guide to count downward. When the patient is sitting with the arms hanging at the side, the inner end of the spine of the scapula is on a level with the third dorsal spine, and the inferior angle of the scapula corresponds to the seventh dorsal spine. The spine of the last dorsal is on a level with the head of the last rib. The highest part of the ilium is about the level of the fourth lumbar spine. Reference to the illustration (Fig. 2) shows the reflexes thus far elicited by me.

Brief reference will now be made to the practical value of the foregoing reflexes.

The Aortic Reflexes.—Cherchevsky [11] first directed attention to an early sign of arteriosclerosis, viz., that in normal conditions the diameter of the aorta varies at different times; that it dilates if the region over the arch is struck with the percussion hammer, while it shrinks in size if the blows are struck in the epigastrium. In arteriosclerosis he contends that it is impossible to produce these variations in diameter. The author, as I have already shown,[12] has misinterpreted the phenomena obtained by his maneuver. What he really elicits is a circumscribed lung contraction adjacent to the part struck on the chest by the hammer, and the blow on the epigastrium merely causes the collapsed lung area to dilate, thus supplanting dulness by resonance. Concussion of the dorsal vertebras, eighth, ninth, tenth, eleventh, and twelfth, will cause dilation of the aorta, and the course of the arch of that vessel can easily be defined, owing to the dulness obtained by strong percussion after vertebral concussion. Concussion of the seventh cervical vertebra causes the dulness to evanesce at once (counterreflex of aortic contraction). The duration of either reflex is from a half to one and a half minutes. That alternate dilation and contraction of the aorta follow the concussional maneuvers already mentioned may be controlled by the röntgen rays. Control investigations have demonstrated that the lung is in no wise implicated in the percussion changes. Evoking the aortic reflexes may be of considerable moment in determining the elasticity of the aorta, and thus recognizing early arteriosclerosis. My investigations on this subject are too limited for citation. Dilation of the aorta, however, may be easily recognized.

The Heart Reflexes.—Heretofore, only one heart reflex was recognized, viz., the heart reflex of contraction, but when the same dorsal vertebras are concussed for evoking the aortic reflex of dilation, a decided increase in the area of cardiac dulness may be obtained by percussion, implicating chiefly the area to the left of the sternum. Not infrequently the lower sternum previously resonant becomes dull on percussion. This increase in the area of cardiac dulness is not associated, as the röntgen rays show, by any increase in the diameters of the heart. The latter fact corresponds with the investigations of Kornfeld,[13] who demonstrated that the heart muscle possesses the property of increasing the size of its cavities without any corresponding augmentation of tension of its walls, a condition which he calls *ausweitungsfähigkeit.*

The clinical applications of the heart reflexes are various. Percussion of the heart, as executed ordinarily, yields an absolute or superficial, and a deep or relative dulness. Practically little or no value can be attached to the superficial dulness in estimating the size of the heart, as it varies with the position of the overlapping lung borders. Even the lightest percussion blow will provoke sufficient cutaneous irritation to induce the lung reflex of dilation, *i. e.*, an acute dilation of the lungs, which may diminish the area of superficial cardiac dulness even to obliteration. Cabot [14] has observed how a forcible percussion blow over the lungs increases the resonance to be obtained by subsequent blows. He says: "Any one who has demonstrated an area of percussion dulness to many students in succession must have noticed occasionally that the more we percuss the dull area, the more resonant it becomes, so that to those who last listen to the demonstration, the difference which we wish to bring out is much less obvious than to those who heard the earliest percussion strokes. Abrams has referred to this fact under the name of the lung reflex." The mere influence of room temperature materially changes the results of percussion. Let any one after percussing the areas of superficial dulness direct a current of cold air, *e. g.*, from an atomizer, over the regions percussed, and the result will be, diminution or obliteration of the areas in question. It is evident from what has preceded that, while the heart reflex can always be determined by the röntgen rays, after cutaneous irritation of the precardium, mere percussion cannot determine its existence, as the irritation necessary to evoke the heart reflex will also induce the lung reflex of dilation, which must necessarily mask the heart reflex.

Thus the observations of Schott and others who seek to demonstrate the effects on the heart by percussion of the carbonated baths are evidently erroneous. Heitler [15] perpetrates the same error by failing to take into consideration the coincident lung reflex when executing cutaneous irritation. He seeks to determine the sufficiency of the heart muscle by a series of percussion blows over the heart region. If thereafter the cardiac dulness is much diminished, it is an evidence, he argues, that the cardiac musculature is sufficient, for the tendency of the normal muscle tonus of the heart is to maintain a limited patch of dulness. Even vigorous percussion to elicit the deep cardiac dulness is replete with error, for it elicits a lung reflex of dilation, which is proportional to the intensity of cutaneous irritation, hence a barrier is interposed by the dilated lung, which interferes with the propagation of the percussion blow to the underlying heart. When clinicians aver that they can delimit the right heart border by a plexor and pleximeter, not only do they defeat their object by inducing the lung reflex of dilation, but by evoking the lung reflex of contraction, the dulness of the latter is confounded with cardiac dulness. One may elicit the heart reflex of contraction without inducing the lung reflex of dilation by concussion of the seventh cervical vertebra. There are many indications for the practical application of the heart reflexes, but space forbids their discussion. Mention may, however, be made of a simple method for differentiating a dilated heart from a pericardial effusion. The heart reflex of contraction may be evoked by concussion of the seventh cervical vertebra, whereas, the counterreflex of heart dilation may be provoked by concussion of the dorsal vertebras already indicated. In the former instance, the area of cardiac dulness will diminish, in the latter, it will be increased in simple heart dilation, whereas in effusion the area will be uninfluenced.

The Liver and Spleen Reflexes.—I have already shown [16] that when the skin contiguous to the lower liver border is irritated with the finger-nail or the blunt end of a pencil, the lower liver border may be observed by percussion to recede a half inch or more depending on the degree of cutaneous irritation. In eliciting this liver reflex it is necessary to map out the lower liver border after the manner suggested by me [17]; the patient is instructed to incline his body backward as far as possible and if now percussion is attempted which must be light and the finger firmly embedded in the tissues, the difficulty of determining the lower liver border is reduced to a minimum. The skin liver reflex only causes a recession of the lower liver border whereas if the liver and spleen reflexes are elicited from the spines of the vertebras, the preceding viscera contract *in toto.* The faculty of the liver and spleen to contract is necessarily diminished in certain pathologic conditions and when such conditions are fully recognized, the liver and spleen reflexes will become endowed with a definite diagnostic significance. It is enough to know, however, from the standpoint of the therapist, that it is possible

to influence these organs by peripheral irritation and while a reflex in itself is a mere objective demonstration of such action, there are a host of other conditions which, when once aroused will substitute a physiologic for a pathologic condition.

The Stomach Reflex.—The stomach and intestinal reflexes have been fully discussed in another contribution[18] to which attention is directed. In this communication, I have attempted to show, that when the first three lumbar vertebras are concussed the tympanicity of the stomach and intestines will be supplanted by dulness. For purposes of diagnosis, it will be necessary to review another method of inducing the stomach reflex of contraction. To elicit the latter reflex, our field of observation is limited to the Traube area, that half-moon shaped space which normally yields on percussion a tympanitic sound owing to the presence of the cardiac end of the stomach. The Traube area is bounded above and laterally by the contiguous borders of the liver, lung and spleen. Firmly fixing our pleximeter (see Fig. 1) in the center of the Traube area of tympanicity, we strike the pleximeter with the mallet a series of vigorous blows and then proceed to percuss the area in question. One observes at once that this region which formerly yielded a tympanitic sound now presents on percussion a dull or even flat sound. The phenomenon thus obtained is the stomach reflex of contraction. It is of variable duration. The stomach reflex of contraction is most conspicuous when the patient is examined before the röntgen rays. According to this method the stomach is moderately distended by air and then concussion is executed by aid of mallet and pleximeter in the Traube area. One observes at once after administration of the vigorous concussion blows that the fundus of the stomach will recede fully an inch or more.

The stomach reflex of contraction may also be provoked after the manner cited by concussion of the abdomen contiguous to the stomach, but the same maneuver will also induce the intestinal reflex of contraction which likewise yields on percussion a dull tympanicity, hence, the stomach reflex should only be obtained from the Traube area for the reflex evoked will be essentially associated with the stomach and not with the intestines. It may be necessary to differentiate a left-sided pneumothorax from a distended stomach or a diaphragmatic hernia. In pneumothorax the stomach reflex of contraction would not be present, but could be evident in the other two conditions. The motor power of the stomach can be gauged by the degree of the stomach reflex; the latter being indicated by the grade of dulness consequent on the concussion blows in the Traube area. I know of no better method for determining the lower border of the stomach by percussion than the maneuver already indicated for inducing the stomach reflex of contraction. One may percuss not only the stomach border but likewise the exposed anterior surface of the stomach for the dulness of the stomach is easily differentiated from the tympany of the surrounding intestines. Here then is a method which achieves a double object, viz., determination of the motor power of the stomach and defining its area. One must percuss quickly as the reflex is of short duration, but if necessary it may again be elicited and topographic percussion completed. A critic may aver that if this stomach reflex is one contraction, the percussional area of the organ will be necessarily diminished. With this contention I agree, but I present the counterargument that in the conventional method of ballooning the stomach the reproduction of the gastric area will be augmented. The presence of a neoplasm and its association with the stomach may be shown to exist by aid of the stomach reflex, for elicitation of the latter will cause a dislocation of the growth upward and to the left. A sensitive point supposed to be connected with the stomach would likewise be dislocated by the same maneuver if really connected with that organ.

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FLUORESCENT TRANSLUMINATION OF THE STOMACH.

BY
SOLOMON SOLIS COHEN, M.D.,
of Philadelphia.

Professor of Clinical Medicine in Jefferson Medical College; Physician to the Philadelphia General Hospital, Etc.

Years ago when Einhorn introduced the gastrodiaphane I used his instrument with some degree of satisfaction, especially in determining the position of the lesser curvature and in discrimination between gastric and hepatic tumors in certain cases favorable for the application of the method. But the number of cases in which the additional information thus gained over the results of other methods of examination has been sufficient to warrant gastrodiaphanoscopy by the original method has, in my personal experience, been comparatively small. The drawbacks have been the limited zone of illumination, and the considerable manipulation of the light rendered necessary, together with some uncertainty as to whether there was not transmission of light occasionally through the colon on the one hand, and failure to reach the true upper border on the other hand. Following W. J. Morton's suggestion of the use of fluorescent solutions in diagnosis and treatment, and R. C. Kemp's demonstration of its value as a means of determining the position and size of the stomach, I have once more taken up the subject. Kemp's technic has been employed, except that I have used my own modification of Einhorn's diaphane instead of Lockwood's stomach light as advised by Kemp. While the latter instrument, according to Kemp, is lighter and more easily swallowed, my instrument gives a firmer terminal for manipulation, and possesses some advantages therefore in cases in which no lesion of the gastric mucous membrane is present. I have not had to resort to pressure upon the abdomen which Kemp speaks of, in order to outline the whole stomach satisfactorily. On the contrary, the simple pushing forward of the tube suffices to bring the viscus into full lumination, the upper portion remaining bright while the greater curvature and gradually what seems to be the whole stomach, is brought into glow. The position of the lamp is marked by a more intense brightness and a deeper color, and its motion along the border can thus be made out. In a case of marked gastroptosis exhibited to visiting members of the American Medical Association this was demonstrated beautifully, the emergence of the lamp from the cardia and its retrocession therein being so clearly visible that no doubt of the position of the organ could be entertained. Especially clear was the position of the umbilicus in relation to the luminous area as indicated on the figure. In another case, also seen by visitors of the American Medical Association, an area of shadow (Fig. 2) in the midst of the illuminated zone, proved at operation to be the lower border of an unusually distended gallbladder stretching in a diagonal direction. The case was one in which the anatomic diagnosis of enlarged liver and pancreas, distended gall-

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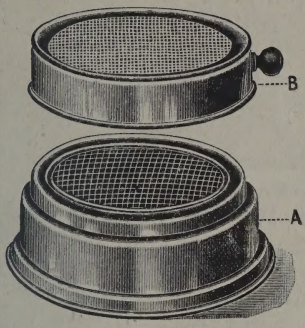


Price, One Dollar

Gibbs Formaldehyde Generator

An asbestos filled receiver for wood alcohol (a), and a chemically prepared asbestos screen (b), which changes the vapors of wood alcohol into Formaldehyde.

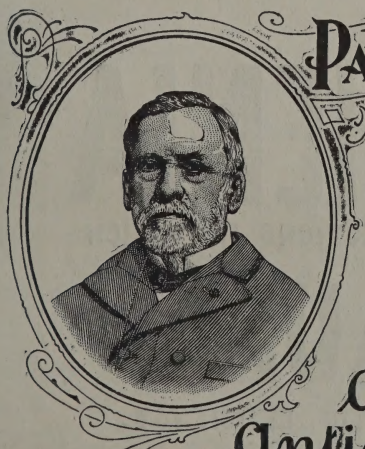
Each generator will thoroughly disinfect *1000 cubic feet* of space. *Upon the size of the room to be disinfected depends the number of generators required.*

Its occasional use in the rooms of a house will destroy or arrest the development of disease germs, while its operation in a closet in which have been placed clothing or such articles as have been subjected to possible infection will not only *thoroughly disinfect* them, but will also *completely purify* them of all *odors*. *No flame. No danger of fire.*

Should be in the *waiting room* of every physician, and in the *homes* of his *patients.*

GIBBS & COMPANY, 102 Fulton Street, New York

Druggists, or by mail upon receipt of price *Write for literature*



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THE WORLD FAMOUS

PASTEUR SERUMS

Antidiphtheritic
Antitetanic Antipest
Antistreptococcic

KEEP INDEFINITELY IN DRY FORM

Sold exclusively by SHARP & DOHME

SOLE DEPOSITARIES U.S.A.

BETUL-OL

A methyl-oleo-salicylate compound with menthol.

TO RELIEVE PAIN

BETUL-OL penetrates the skin rapidly, producing anodyne effects and local antiseptic action at the seat of inflammatory rheumatic, gouty, neuralgic or sciatic pain.

BETUL-OL contains no morphine or cocaine; it is soluble in all proportions of ether, alcohol, chloroform or oils, and may be used either pure or in combination as a liniment.

50 CENTS AN OUNCE.

E. FOUGERA & CO.
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RELIABLE AGENT IN
GOUTY
AND
RHEUMATIC
MANIFESTATIONS

NOTE.—Prescribe bottles of 50 or 100 Capsules of Colchi-Sal and avoid failures to relieve, due to substitution of imitations for the original "Little Green Capsules."

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THE LEEMING MILES CO. LD
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NEURASTHENIA

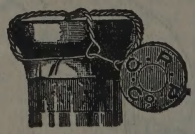
IS ANOTHER OF THE NERVOUS AFFECTIONS IN WHICH

ARSENAURO

HAS DEMONSTRATED ITS THERAPEUTIC EFFICIENCY.

PUSH DOSAGE TO POINT OF SATURATION IN EACH INDIVIDUAL PATIENT

EVERY GENUINE BOTTLE BEARS THIS SEAL



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